

# CUEXCOMATE: FROM THE SMALLEST VOLCANO TO THE BIGGEST GEYSER ON EARTH

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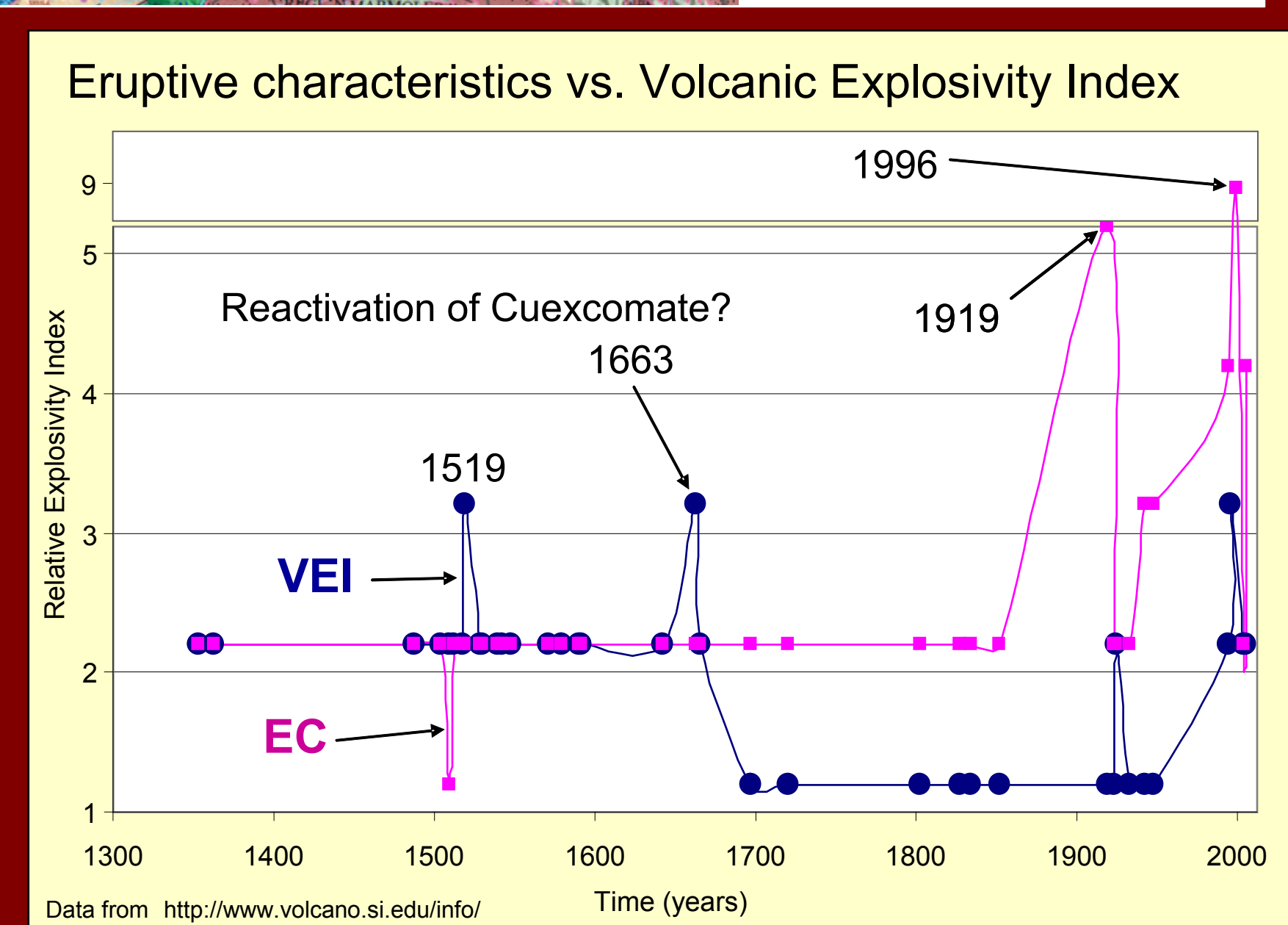
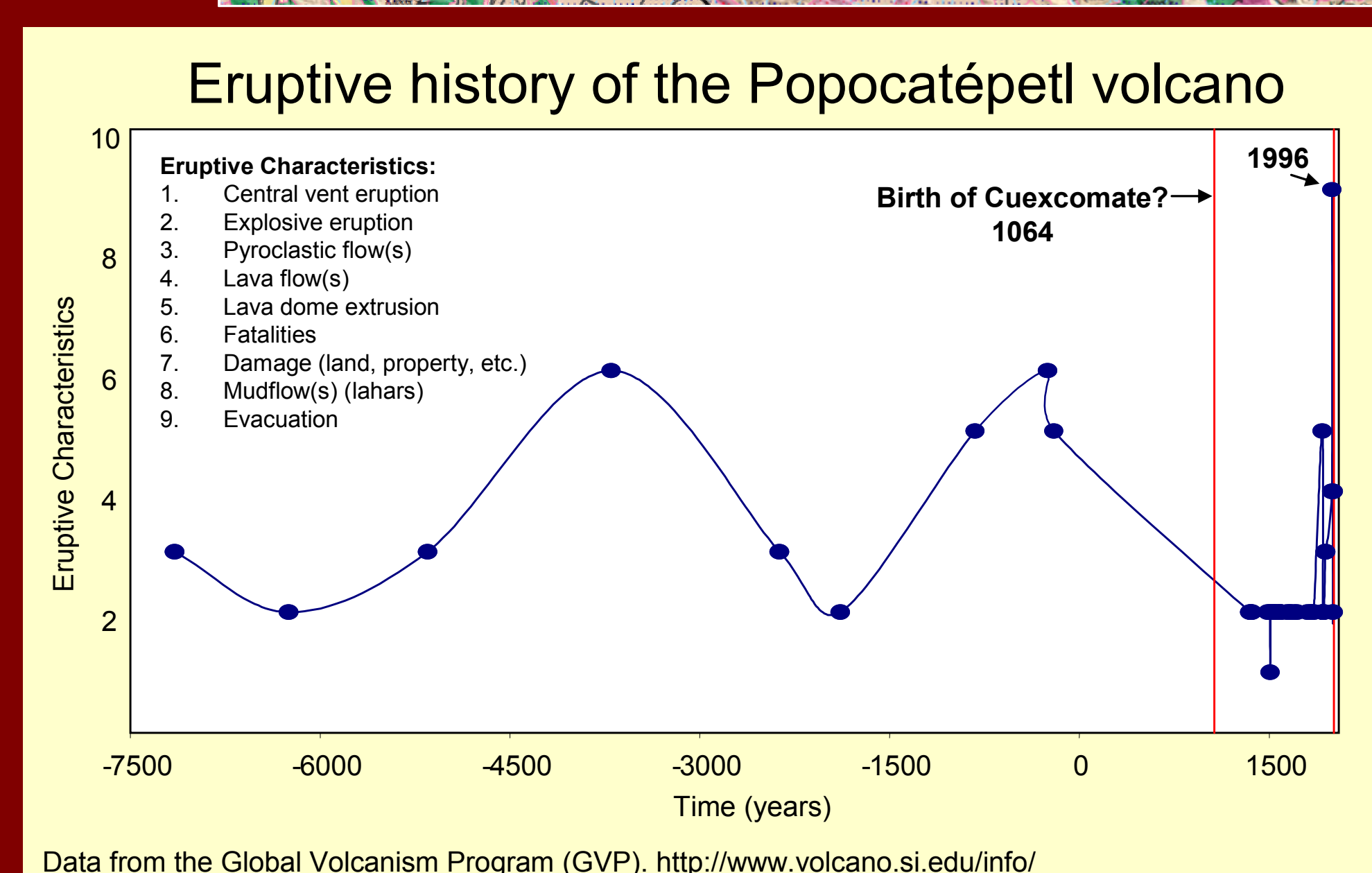
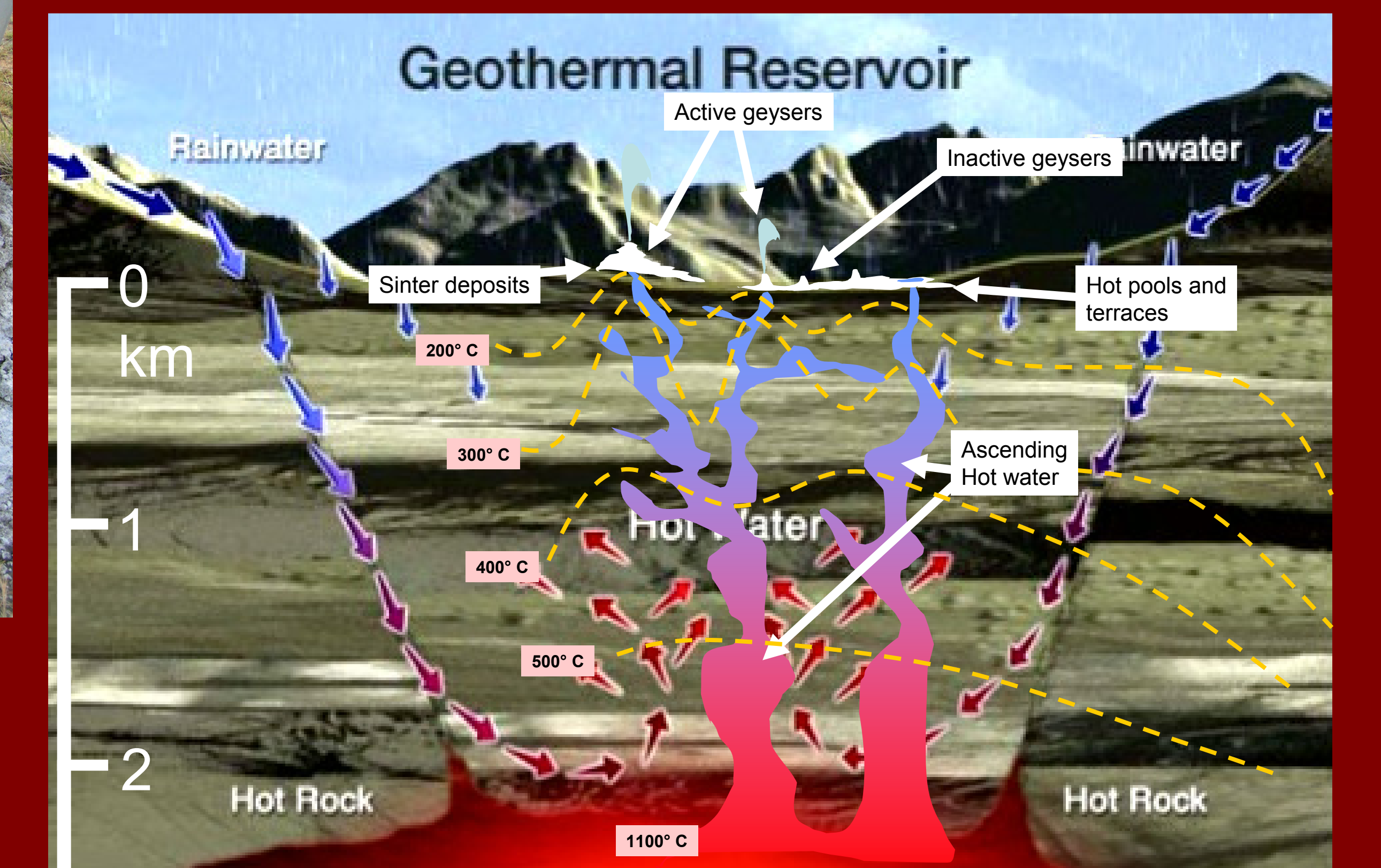
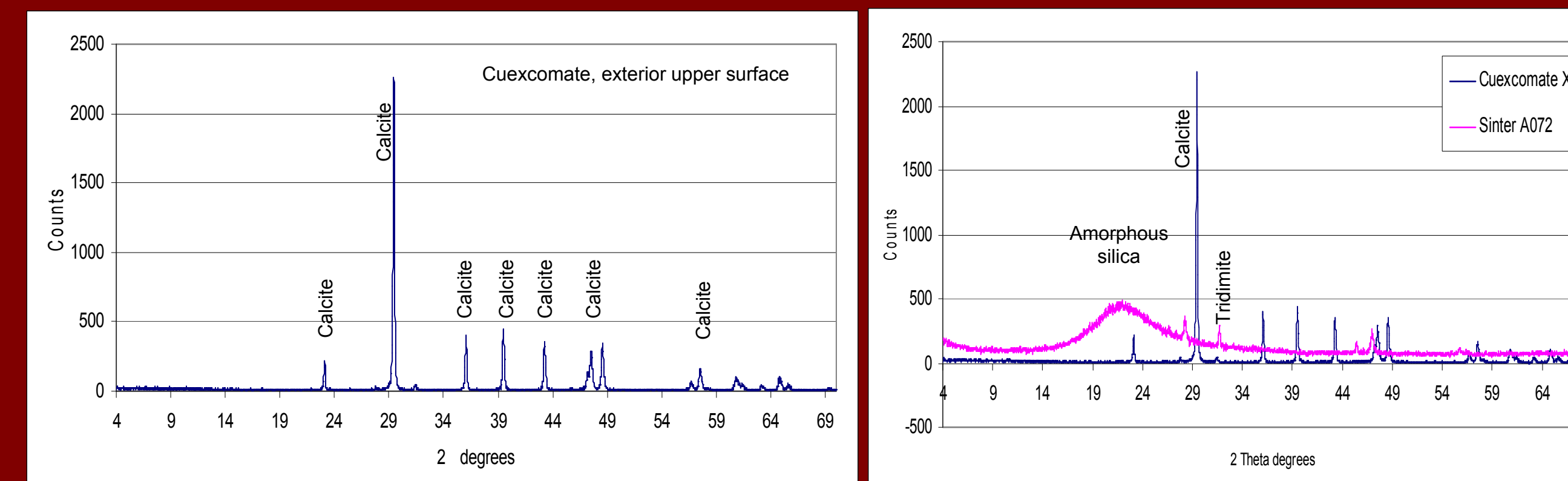
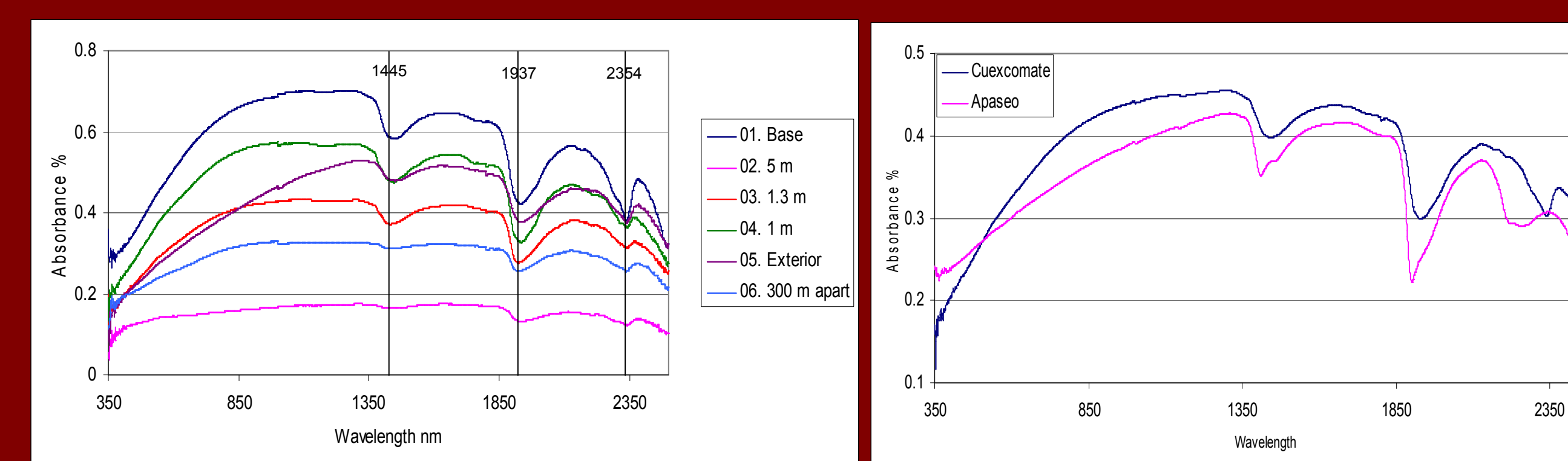
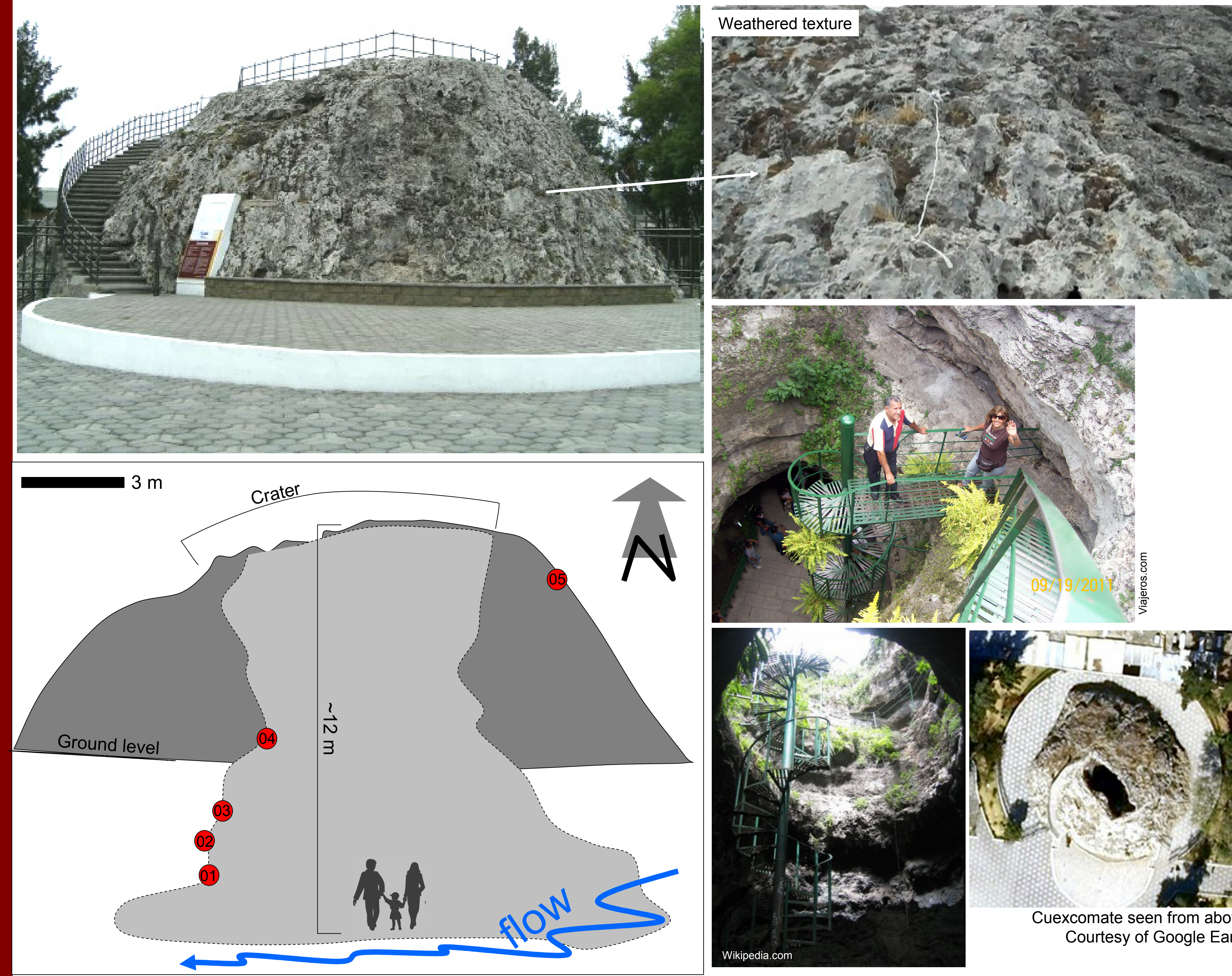
## SUMMARY

Completely surrounded by urban development in the city of Puebla, Mexico, the Cuexcomate (from the Náhuatl 'cuexcomatl', meaning 'bucket' or 'pot') geyser cone deposit has been mistakenly believed to be a 'small volcano' by the local population for centuries. The concept of 'volcano' was coined because of its dome-shaped exterior and its central crater, similar to a volcano.

The Cuexcomate is a chemical (calcitic) hydrothermal deposit (geyserite) of considerable size: ~28.5 x 24.3 m in diameter, stands ~8.4 m above the ground, and its ~10 x 5 m-diameter internal crater goes down ~4 m below ground (total depth ~12 m). The roomy interior serves as cultural/touristic attraction. Ambient-temperature water still flows in the bottom interior, connecting with a natural underground discharge of unknown path.

Although no absolute ages are known for the Cuexcomate, Puebla's municipal government sustains that the Cuexcomate was originated ~948 years ago, in 1064, and was reactivated ~349 years ago, in 1664. Important peaks of activity of the Popocatepetl volcano (~40 km to the West of Cuexcomate) before the year 1900, occur approximately 349, 493, and 5712 years ago. It is unclear whether the Cuexcomate was formed during Popocatepetl's mild activity or not. Radiometric dating is needed.

The Cuexcomate clearly had a hydrothermal origin. It can be compared in shape, texture, and composition to analog, currently-active geysers around the world. Yet none compares in size with the Cuexcomate; the largest being ~5 m tall. The non-reported-yet Apaseo sinters (North of the Trans-Mexican Volcanic Belt) are used here to compare different mineralogical compositions (Cuexcomate = 90 % calcite, Apaseo sinters = 90% amorphous silica) with similar shapes and origins, typical of hydrothermal deposits in which the underground basement defines the composition of the precipitates. Data on Cuexcomate's chemical composition are presented here for the first time.



## CONCLUSIONS

- The Cuexcomate represents the oldest evidence of hydrothermal activity reported for the Popocatepetl volcano.
- Because the Cuexcomate had a hydrothermal origin, it denies the historical idea that cuexcomate is a volcano.
- The Cuexcomate is established here as a geyserite deposit of 90 % calcitic composition.

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